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# FOREST CONTROL

*by*

# CONTINUOUS INVENTORY

"Today I have grown taller from walking with the trees."

...Karle Wilson

Milwaukee, Wis. July, 1961 No. 88

## MORE ABOUT FOREST VALUATION INVENTORIES

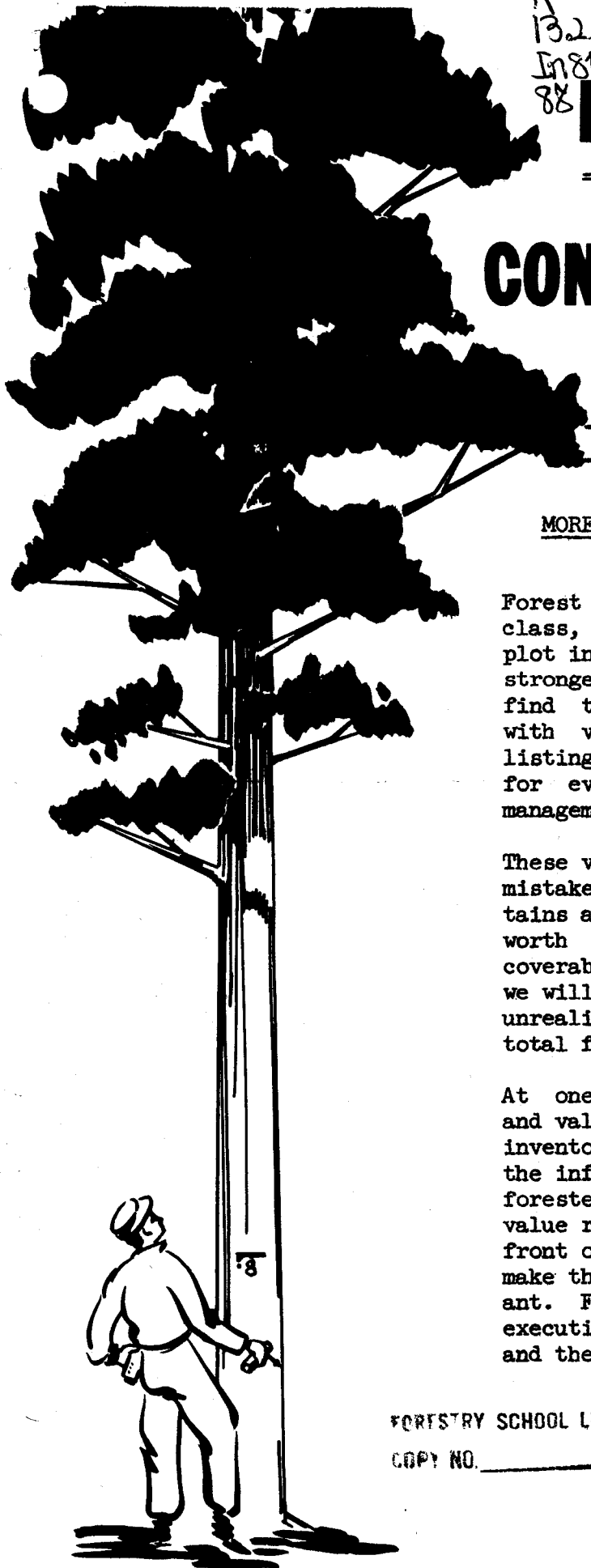
Forest product value by grade and dimension class, for every tree tallied in permanent plot inventories, can become the forester's strongest ally. Think what it may mean to find these values in constant association with volume and growth in every machine listing; to discuss them in a joint manner for every plan and undertaking of forest management.

These values in place will be high; make no mistake about that. Every large forest contains a wealth of wood. Unfortunately, this worth "insitu" is not always currently recoverable. We have long known this, and now we will also know the true extent of these unrealizable values on both a tree and a total forest basis.

At one fell swoop these associated volumes and values will become available when the inventory is completed, and soon thereafter the information will begin to appear in the forester's reports. Eventually these volume-value ratios will land in the laps of the front office personnel. Gradually they will make their way to the ledgers of the accountant. From there it is a short jaunt to the executive staff, the board of directors, and the stockholders.

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CAL STOTT  
Region 9



GENERAL AND BASIC RULES FOR FIELD ERROR CORRECTION  
IN THE TREE DETAIL CARD

May 3, 1961

1. The current or present tree records, after careful checking, are always assumed to be the final answers when compared with previous records which are questionable. This is especially true for DBH and usable length errors.
2. Records of minus or negative growth are sometimes found at remeasurement. This is legitimate unless proved to be an obvious error, for between measurements DBH can reduce due to bark slough, and usable length can reduce due to top rot or breakage.
3. Experience tells the cruiser about what to expect in the individual tree dimensions and description at remeasurement time. Extreme or impossible differences are almost always readily recognizable.

DBH ERRORS

4. Every CFI job has occasional trees the diameters of which are unmeasurable and must be estimated. It is necessary to repeat diameter estimates of these trees at the time of remeasurement.
5. Minus or negative DBH growth sometimes occurs and is justified. Retain these minus values when they are small and not obvious errors.
6. When an unusually high DBH is found, and the extraordinary growth seems to be unjustified, the tree may be bored and the previous DBH brought into line. Estimated corrections made without boring are permitted with sufficient experience to back them up.

USABLE LENGTH ERRORS

7. Minus or negative usable length records sometimes occur and are justified. Retain these minus values if not obvious errors.
8. When minus length growth occurs, and cannot be justified, adjust the previous length to the present length. Very few trees reduce in length during remeasurement intervals.
9. When adjusting past lengths to the present for correction purposes, it is permissible to allow for a reasonable usable length change during the period. Many trees have an annual top ingrowth over a 5-year remeasurement interval.
10. A top ingrowth in usable length of more than 2 feet per year seldom occurs under normal conditions, though there are exceptions.
11. Trees which do not have a fixed usable length, but are free to grow in length at the previous measurement, will average about 1 foot of length increase per year, depending upon the growth potential of the tree.
12. Usable length errors of 2 feet are seldom corrected. In such cases the present length may be adjusted back to the previous.
13. Errors of 4 feet are similarly tolerated except:

Where the cruiser's error seems to be habitual  
In short trees the lengths of which can be pole measured  
Where intensive research-type studies are being made

14. Obvious length errors of 6 feet and over are always corrected.

SOUNDNESS CLASS ERRORS

15. The soundness class of trees sometimes improves between measurements. This may be justified for the following reasons:

Trees with sweep become straighter as they increase in girth  
Soundness class in trees may improve as the length of the tree increases  
Cull and rot may not spread significantly but remain pocketed as the tree grows

16. Since rot generally tends to spread, a periodic increase in cull is to be expected. The soundness class seldom improves. Varying by species, as soon learned by experience, the spread of rot may be light or heavy, and commercial trees may even become completely cull in the remeasurement interval.
17. The spread of rot generally varies with the vigor of the tree and the locality in which it is growing.
18. Obvious and consistent differences of more than one soundness class between measurements should be scrutinized carefully and corrected if obviously in error.
19. Differences of one soundness class or less between measurements are seldom correctable.

Standard soundness classes for Region 9 are  
.97, .93, .86, .78 and .65 percent

PUNCHING OR CODING ERRORS OR MISINTERPRETATION OF STANDARDS

20. Mistakes of this kind occur throughout the field work. Some of the errors are caught in sort checks while the field work is in progress, or later when the machine work is done, but a few mistakes always seem to get by the checking barriers and are not discovered until remeasurement time. At this time corrections are made in accordance with the instructions for Allowable, Optional and Correctable errors in CFI field work.

## THE TREE DETAIL CARD

| THE P.A.P. CARD ITEM                                    | THE DETECTED ERROR  | P.A.P. CARD TO BE CORRECTED & ERROR CODE PUNCHED | CORRECT ENTRY TO BE WRITTEN IN | DETAIL WORK NEEDED IN THE FIELD   |
|---|---|--|--------------------------------|---|
| TREE NUMBER   | Same paint number on different trees  | Yes  | Yes                            | Renumber one of the two trees with paint in the woods.  |
|   | Tree previously missed (not ingrowth)   | Yes  | No                             | Punch a card for the previous measurement, assuming all values.   |
|   | Paint number not on tree in woods   | No   | No                             | Paint number the tree in the woods.   |
|   | Trees which should not have been taken  | Yes  | Yes                            | Cross out the paint number on the tree in the woods. Substitute an ingrowth tree for the number crossed out.  |
| TREE SPECIES  | Species coded incorrectly or misidentified  | Yes  | Yes                            | Check the species carefully.  |
| DBH   | Previous DBH higher than present DBH or previous DBH much too low                               | Yes  | Yes                            | Correct by boring or estimating the previous DBH. Make allowance for the effect of site, and tree vigor on the DBH growth for the period. See basic rules.  |
| USABLE LENGTH   | Previous length greater than present length   | Yes  | Yes                            | Correct when unjustifiable. Adjust previous length to present, or a reasonable amount less than this to allow for top ingrowth. Errors of 4 feet and over generally correctable. See basic rules.                         |
|   | Previous length less than present by an obviously false amount                                  | Yes  | Yes                            | Correct when unjustifiable. Increase the previous length allowing for a reasonable top ingrowth. Errors 6 feet and over generally detectable and correctable. Do not be too critical in this correction. See basic rules. |
| SOUNDNESS CLASS   | Previous soundness class higher than present. Cull has decreased.                               | Yes  | Yes                            | Correct obvious errors of more than one soundness class. See basic rules.   |
|   | Previous soundness class less than present. Cull has increased excessively                      | Yes  | Yes                            | Often a legitimate difference. Correct obvious errors of more than two soundness classes. See basic rules.  |
| VIGOR CLASS   | Habitual up or down-grading of tree vigor is sometimes evident                                  | Yes  | Yes                            | Correct only the most serious habitual errors, of more than one vigor class. Changing previous cull trees to present commercial generally not advised.  |
| TREE QUALITY CLASS                                      | Misjudging dimensions of factory logs thus introducing log quality grade errors                 | Yes  | Yes                            | Remeasure the dimensions and soundness of the log, and re-assess the factory log grade, where it is obvious the previous dimensions were incorrect. Pulpwood quality grades seldom corrected.                             |
| PRODUCT AND TREE STATUS                                 | Obvious errors sometimes slip by previous checking barriers                                     | Yes  | Yes                            | Correct obvious errors where it is certain there has been no change in the forest product or tree status since the previous measurement.  |
| MANAGEMENT POTENTIAL                                    | Obviously incorrect code  | Yes  | Yes                            | Errors seldom correctable unless there has been an obvious misinterpretation of the standards.  |
| CARD PUNCHING, CODING OR MISINTERPRETATION OF STANDARDS | Previous records bear no reasonable relationship to the true answers in any particular category | Yes  | Yes                            | These are general errors not specifically covered previously; a catch-all for errors to be corrected. See basic rules.  |

GENERAL RULES FOR FIELD ERROR CORRECTIONThe Plot Master Card

Forest cover within the boundary of the fixed radius plot is subject to constant change. Over a five-year remeasurement period these changes may be extreme due to cutting or natural catastrophic disturbance. Even gradual or creeping ecological changes in the forest may cause changes in stand density, size class or cover over large forest areas. It is therefore difficult, at remeasurement time, to realistically assess the error situation in the plot master cards, and only quite obvious mistakes are correctable. Guides to error correction for area break information are relatively simple.

AREA BREAKS WHICH SHOULD NOT CHANGE BETWEEN INVENTORIES

| <u>The Area Break</u> | <u>The Correction</u>  |
|-----------------------|--|
| Soil                  | These area break items may be found obviously in error due to poor judgment or because of faulty punching. In either case a change of the original card record is necessary. |
| Elevation             |  |
| Topography            |  |
| Soil Moisture         |  |
| Site Quality          |  |
| Degree of Slope       |  |
| Exposure or Aspect    |  |

AREA BREAKS WHICH MAY CHANGE GRADUALLY OR CATASTROPHICALLY BETWEEN INVENTORIES

| <u>The Area Break</u> | <u>The Correction</u>   |
|-----------------------|---|
| Age Class             | These area break items are seldom found in obvious error, since sort checks previously resolved these errors. Punching errors occasionally occur, and sometimes there are mistakes of judgment which need correction. Try to avoid hypercritical judgments. |
| Operability           |   |
| Cover Type            |   |
| Stand Size Class      |   |
| Stand Density Class   |   |
| Cutting Period        |   |
| Understory Condition  |   |
| Silv. Recommendation  |   |

Handling error cards in the woods at remeasurement time is done as previously explained for the Tree Detail Cards.

Damaging Insects Are Found in All Forest Types

## North Central Region

A Reference List for Use with Continuous Forest Inventory in Region 9, Jan. 1961

| Major Forest Type                | Insect                         | Major Hosts                                      | Type of Injury                 |
|----------------------------------|--------------------------------|--|--------------------------------|
| Aspen-birch                      | * Forest tent caterpillar      | Aspens, birches                                  | Defoliation                    |
|                                  | Poplar borer                   | Aspens   | Boring                         |
|                                  | Bronze poplar and birch borers | Aspens & birches                                 | Boring (secondary)             |
| Hardwoods<br>(including hemlock) | * Forest tent caterpillar      | Sugar maple                                      | Defoliation                    |
|                                  | * Walkingstick                 | Oak, basswood                                    | Defoliation                    |
|                                  | Leaf roller and webworm        | Sugar maple                                      | Defoliation                    |
|                                  | Hemlock looper                 | Hemlock  | Defoliation                    |
|                                  | Hemlock borer                  | Hemlock  | Boring (secondary)             |
| Spruce-fir                       | * Spruce budworm               | Balsam fir, spruces                              | Defoliation                    |
|                                  | * Larch sawfly                 | Tamarack   | Defoliation                    |
|                                  | Larch casebearer               | Tamarack   | Defoliation                    |
|                                  | Cone insects                   | White spruce                                     | Destruction of cones and seeds |
| Northern Pine                    | * Jack pine budworm            | Jack pine<br>(red and white pines in understory) | Defoliation                    |
|                                  | * Sawflies                     | All pines  | Defoliation                    |
|                                  | White pine weevil              | White and jack pines                             | Tip injury                     |
|                                  | Pine tortoise scale            | Jack pine  | Sucking insect                 |
|                                  | Pine root collar weevil        | Jack and red pines                               | Girdling root collar           |
| Plantations                      | * Sawflies                     | All pines  | Defoliation                    |
|                                  | Pine chafer                    | Jack pine  | Defoliation                    |
|                                  | White pine weevil              | All pines, Norway spruce                         | Tip injury                     |
|                                  | European pine shoot moth       | Red and Scotch pines                             | Tip injury                     |
|                                  | Zimmerman pine moth            | Red and Scotch pines                             | Tip injury                     |
|                                  | Jack pine shoot moth           | Jack pine  | Tip injury                     |
|                                  | Pine root collar weevil        | Jack, red, and Scotch pines                      | Girdling of root collar        |
|                                  | Saratoga spittlebug            | Red and jack pines                               | Sucking insect                 |
|                                  | Pine tortoise scale            | Jack and Scotch pines                            | Sucking insect                 |

\* Widespread and epidemic in nature. Sometimes coded for intensity in special C.F.I. studies.

BRIEF OUTLINE OF MANAGEMENT POTENTIAL CODES FOR CFI INVENTORIES  
CONDENSED FROM NEWSLETTER NO. 82

Management Potential is a term given to the classification of commercial trees as an aid in the determination of the allowable cut under optimum silvicultural and forest management practices.

| TREE<br>CODE<br>NUMBER | <u>MANAGEMENT POTENTIAL CLASS DESCRIPTION FOR EACH TREE IN THE SAMPLE</u>   |
|------------------------|---|
| 0                      | Use for blank plots or for trees that are dead, cut, or otherwise missing at remeasurement time.  |
| 1.                     | Use for trees to be left to grow. Includes commercial tree species most frequently managed selectively. These species, to be fully listed with the field instructions, may occur in any forest type.  |
| 2.                     | Use for trees to be left to grow. Includes commercial species most frequently managed with a clear cut silvicultural method. Trees in this class are of good vigor, and while they do not need to be cut they would be removed if the species is recommended to be cut. In this group are aspen, jack pine, paper birch, balsam fir and black spruce. |
| 3.                     | Use for trees to be cut. Includes commercial trees of any species damaged or dying due to insects or disease, often present in epidemic form.   |
| 4.                     | Use for trees to be cut. Includes any commercial species of tree definitely mature or overmature even though of medium or high vigor.   |
| 5.                     | Use for trees to be cut. Includes commercial tree species of low vigor and high risk.   |
| 6.                     | Use for trees to be cut. Includes commercial trees to be taken out of the stand on a partial cut basis, to improve the species composition, better the species - site relationship, or reduce the basal area.   |
| 7.                     | Use for worthless or cull trees. Includes certain species or conditions of tree defined as having no commercial value whatsoever.   |
| 8.                     | Use for poor vigor trees of commercial species submerchantable in length, (generally 4 to 14 feet, but may vary from job to job). Includes trees which should be cut because of their condition, but most likely will not be cut because of their short length. They <u>will seldom</u> develop into future products.                                 |
| 9.                     | Use for good vigor trees of commercial species submerchantable in length, (generally 4 to 14 feet, but may vary from job to job). Includes trees which <u>will develop</u> into future products and which should therefore be left to grow.   |

Arrangement of the codes is such that when a choice between two codes exists, the lower code number should be used.

George Semmens  
Forester